

LISTING OF CLAIMS

1. (amended) A system for measuring specimen thickness variations by scanning both sides of a two sided specimen, comprising:
 - a variable coherence light energy generating device;
 - a collimator for collimating light energy received from a the variable coherence light energy generating device into two separate channels;
 - at least one diffraction grating arrangement for receiving uniform wavefront light energy transmitted from each channel of said collimator and passing nonzero order light energy toward each side of said specimen;
 - a plurality of reflective surfaces for receiving light energy from each the diffraction grating arrangement, each of said reflective surfaces separate from said specimen; and
 - a receiving second diffraction grating for receiving light reflected from said specimen and from each reflective surface;

wherein said variable coherence light energy generating device, said collimator, said diffraction grating arrangement, said plurality of reflective surfaces, and said receiving diffraction grating operate to measure specimen thickness variations

wherein said second diffraction grating is mounted substantially perpendicular to said specimen and said plurality of reflective surfaces.
2. (amended) The system of claim 1, wherein each reflective surface receives nonzero order light energy passed from one the diffraction grating.
3. (amended) The system of claim 1, further comprising a blocking element for blocking passage of zero order light energy received from at least one the diffraction grating.

4. (previously presented) The system of claim 1, further comprising a calibration element, wherein said calibration element is employed in place of said two sided specimen to calibrate the system and said two sided specimen is scanned subsequent thereto.

5. (previously presented) The system of claim 1, further comprising at least one camera, wherein each camera converts an elliptical image of at least one side of said specimen into an image having an aspect ratio closer to 1:1.

6. (previously presented) The system of claim 1, further comprising at least one receiving collimator, wherein each receiving collimator comprises at least one lens.

7. (amended) The system of claim 1, wherein nonzero order light energy passes from said diffraction grating arrangement toward at least one reflective surface and said specimen.

8. (previously presented) The system of claim 1, wherein at least one reflective surface is semitransparent, and said system further comprises an interferometric normal incidence inspection device.

9. (previously presented) The system of claim 8, wherein said interferometric normal incidence inspection device comprises a light emitting device, a beam splitter, and a collimator.

10. (amended) The system of claim 1, wherein said first the diffraction grating arrangement is optimized for zero intensity of its zero order.

11. (amended) A method for measuring specimen thickness variations by inspecting both sides of a dual sided specimen simultaneously, comprising the steps of:

transmitting relatively low coherence light energy toward said specimen;

diffracting said light energy into multiple channels of nonzero order light energy;

directing said multiple channels of nonzero order diffracted light energy toward both sides of said specimen and toward a plurality of reflective surfaces each mounted substantially parallel to said specimen;

receiving nonzero order light energy reflected from both sides of said specimen and each reflective surface and combining the received light energy to measure specimen thickness variations; and

~~directing said light energy to a light receiving device.~~

12. (previously presented) The method of claim 11, wherein said diffracting step comprises diffracting for zero intensity of the zero order of the light energy received.

13. (amended) The method of claim 11, further comprising ~~the step of~~ initially calibrating the system prior to said transmitting step.

14. (previously presented) The method of claim 11, further comprising the step of performing an interferometric normal incidence inspection on the specimen prior to said transmitting step.

15. (previously presented) The method of claim 11, further comprising the step of performing an interferometric normal incidence inspection of the specimen after said directing step.

16. (previously presented) The method of claim 11, wherein said light energy forms an image, and said directing step comprises altering the image aspect ratio.

17. (amended) An apparatus for measuring specimen thickness variations by inspecting both sides of a two sided specimen, comprising:

~~an a variable coherence~~ energy transmitting device;

a light energy splitting device for isolating nonzero order components of variable coherence light energy received from said variable coherence energy transmitting device; and

a plurality of reflecting surfaces, ~~each reflecting surface mounted substantially parallel to said specimen and receiving nonzero order energy from said light energy splitting device;~~

wherein said light energy splitting device directs nonzero energy simultaneously toward one reflecting surface and one surface of said two sided specimen, and wherein said direction of nonzero energy enables thickness measurement of the specimen.

18. (previously presented) The apparatus of claim 17, wherein said light energy splitting device directs said nonzero components of light energy toward said two sided specimen and at least one said reflecting surface.

19. (previously presented) The apparatus of claim 17, wherein at least one reflecting surface is semi transparent.

20. (previously presented) The apparatus of claim 17, further comprising an interferometric normal incidence inspection device.

21. (previously presented) The apparatus of claim 19, wherein said interferometric normal incidence device comprises a beamsplitter and a collimator.

22. (previously presented) The apparatus of claim 17, further comprising a blocking surface for blocking zero order components from said light energy splitting device.

23. (previously presented) The apparatus of claim 17, further comprising a camera arrangement, said camera arrangement receiving an image at a first aspect ratio and recording said image at a second aspect ratio.